IN THE CLAIMS

1. (Previously Presented) A minute ventilation sensing device, comprising:

excitation current electrodes for imposing a current field in the thoracic cavity;

an exciter for supplying excitation current as an excitation current waveform at a specified excitation frequency and amplitude between the excitation current electrodes;

a plurality of selectable voltage sense electrodes for generating a voltage sense signal corresponding to a potential difference between two points in the thoracic cavity;

sampling circuitry for sampling the voltage sense signal during the excitation waveform at a specified sampling rate that corresponds to the excitation frequency;

circuitry for demodulating and filtering the voltage sense signal samples into a ventilation band to thereby generate a ventilation signal;

circuitry for deriving a signal proportional to minute ventilation from the ventilation signal;

circuitry for detecting noise when no excitation current is supplied by filtering the voltage sense signal when no excitation current is supplied into the ventilation band and for computing an average noise level;

a switch matrix with the capability of switching between different electrode configurations for use as voltage sense electrodes; and,

circuitry for operating the switch matrix to select a configuration of voltage sense electrodes for use by the device that result in the lowest average noise level.

2. (Original) The device of claim 1 further comprising:

circuitry for computing an average signal level from the voltage sense electrodes; and,

circuitry for selecting a configuration of voltage sense electrodes for use by the device that result in the highest signal-to-noise ratio.

3. (Previously Presented) The device of claim 2 further comprising:

a plurality of selectable excitation current electrodes, wherein the switch matrix has the capability of switching between different configurations of the plurality of excitation current electrodes; and,

circuitry for selecting a configuration of voltage sense and excitation current electrodes for use by the device that result in the highest signal-to-noise ratio.

4. (Original) The device of claim 1 wherein the plurality of selectable voltage sense electrodes includes a tip or ring electrode of a sensing/pacing lead and an indifferent electrode located on a header of the device.

5. (Original) The device of claim 3 wherein the plurality of selectable voltage sense electrodes includes a tip or ring electrode of a sensing/pacing lead and an indifferent electrode located on a header of the device and further wherein the plurality of selectable excitation current electrodes includes a tip or ring electrode of a sensing/pacing lead and a conductive housing of the device.

6. (Original) The device of claim 5 wherein the plurality of selectable voltage sense and excitation current electrodes include the tip and ring electrodes of a plurality of sensing/pacing leads.

7. (Original) The device of claim 6 wherein the circuitry for selecting a configuration of voltage sense and excitation current electrodes selects between an atrial sensing/pacing lead and a ventricular sensing/pacing lead, where the tip and ring electrodes of the selected lead are used as excitation current and voltage sense electrodes.

8. (Original) The device of claim 1 wherein the circuitry for demodulating the voltage sense signal samples generates a weighted average of the voltage sense signal samples with a filter coefficient for each sample that is positive or negative in accordance with the polarity of the excitation current waveform.

9. (Original) The device of claim 8 wherein the excitation current waveform is output as a strobe made up of a specified number of excitation current waveform cycles with each strobe repeated at a specified strobing frequency.

10. (Original) The device of claim 8 wherein the noise detecting circuitry filters the voltage sense signal samples with filter coefficients equal to the filter coefficients used by the demodulating circuitry for filtering the voltage sense signal samples of the excitation current waveform.

11. (Canceled)

12. (Previously Presented) A cardiac rhythm management device, comprising:

a sensing channel for detecting intrinsic cardiac activity;

a pacing channel for pacing the heart;

a controller for delivering paces in accordance with a programmed mode as modulated by a minute ventilation sensor;

a minute ventilation sensor, comprising:

excitation current electrodes for imposing a current field in the thoracic cavity;

an exciter for supplying excitation current as an excitation current waveform at a specified excitation frequency and amplitude between the excitation current electrodes;

a plurality of selectable voltage sense electrodes for generating a voltage sense signal corresponding to a potential difference between two points in the thoracic cavity;

sampling circuitry for sampling the voltage sense signal during the excitation waveform at a specified sampling rate that corresponds to the excitation frequency;

circuitry for demodulating and filtering the voltage sense signal samples into a ventilation band to thereby generate a ventilation signal;

circuitry for deriving a signal proportional to minute ventilation from the ventilation signal;

a switch matrix with the capability of switching between different electrode configurations for use as voltage sense electrodes;

circuitry for detecting noise when no excitation current is supplied by filtering the voltage sense signal when no excitation current is supplied into the ventilation band and for computing an average noise level; and,

circuitry for operating the switch matrix to select a configuration of voltage sense electrodes for use by the device that result in the lowest average noise level.

13. (Previously Presented) A method for operating a minute ventilation sensing device, comprising:

imposing a current field in the thoracic cavity as an excitation current waveform at a specified excitation frequency and amplitude;

generating a voltage sense signal corresponding to a potential difference between two points in the thoracic cavity;

sampling the voltage sense signal during the excitation waveform at a sampling rate that corresponds to the excitation frequency;

demodulating and filtering the voltage sense signal samples into a ventilation band to thereby generate a ventilation signal;

deriving a signal proportional to minute ventilation from the ventilation signal; and,

selecting a configuration of voltage sense electrodes for use by the device among a plurality of available configurations, wherein the plurality includes at least a first voltage sense electrode configuration and a second voltage sense electrode configuration, by:

for each of the first and second voltage sense electrode configurations, detecting noise in the voltage sense signal while no excitation current is supplied by filtering the voltage sense signal when no excitation current is supplied into the ventilation band and computing an average noise level; and,

as between the first and second voltage sense electrode configurations, selecting the configuration of voltage sense electrodes that results in the lowest average noise level.

14. (Previously Presented) The method of claim 13 further comprising:

for each of the first and second voltage sense electrode configurations, computing an average signal level from the voltage sense electrodes; and,

selecting the configuration of voltage sense electrodes for use by the device that result in the highest signal-to-noise ratio.

15. (Original) The method of claim 14 further comprising:

selecting a configuration of voltage sense and excitation current electrodes among a plurality of selectable voltage sense and excitation current electrodes for use by the device that results in the highest signal-to-noise ratio.

16. (Original) The method of claim 13 wherein the plurality of selectable voltage sense electrodes includes a tip or ring electrode of a sensing/pacing lead and an indifferent electrode located on a header of the device.

17. (Original) The method of claim 15 wherein the plurality of selectable voltage sense electrodes includes a tip or ring electrode of a sensing/pacing lead and an indifferent electrode located on a header of the device and further wherein the plurality of selectable excitation current electrodes includes a tip or ring electrode of a sensing/pacing lead and a conductive housing of the device.

18. (Original) The method of claim 15 wherein the plurality of selectable voltage sense and excitation current electrodes include the tip and ring electrodes of a plurality of sensing/pacing leads.

19. (Original) The method of claim 18 further comprising selecting a configuration of voltage sense and excitation current electrodes made up of either an atrial sensing/pacing lead or a ventricular sensing/pacing lead, where the tip and ring electrodes of the selected lead are used as excitation current and voltage sense electrodes.

20. (Original) The method of claim 13 further comprising:

demodulating the voltage sense signal samples by generating a weighted average of the voltage sense signal samples with a filter coefficient for each sample that is positive or negative in accordance with the polarity of the excitation current waveform; and,

detecting noise by filtering the voltage sense signal samples with filter coefficients equal to the filter coefficients used to demodulate the voltage sense signal samples of the excitation current waveform.